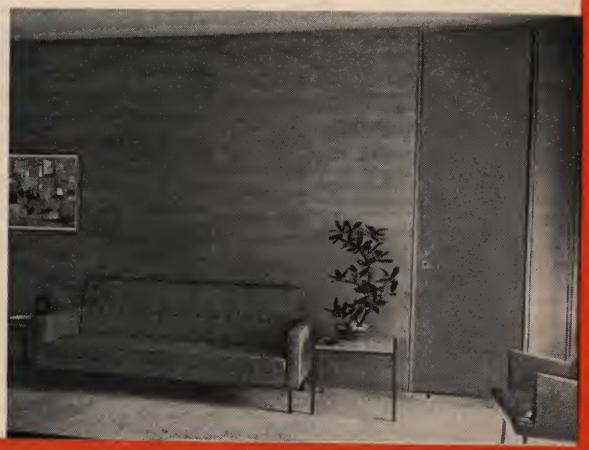
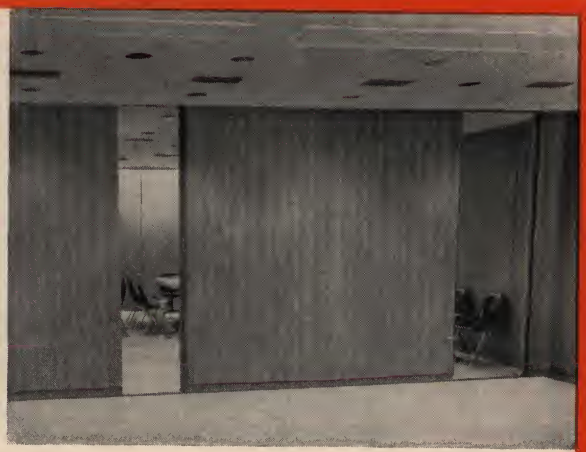
Munchhausen® soundproof doors and partitions



CIT Corporation
650 Madison Avenue
New York

WMGM Radio Station
400 Park Avenue
New York



House of Seagram
375 Park Avenue
New York

where silence matters®

MUNCHHAUSEN SOUNDPROOFING COMPANY, INC. • NEW YORK

THE *Munchhausen*®

CONCEPT OF

SOUNDPROOF DESIGN

The degree of soundproofness of doors and partitions bearing the *Munchhausen* trademark—embodying the wedge frame shown in section on front cover—is so high that it has created a new standard of acoustical excellence. Leading architects and acousticians in the United States and abroad have come to regard *Munchhausen* doors and partitions as the practical, reliable solution to the ever more frequent need for good sound insulation.

Perfect edge sealing, intelligent use of practical standard hardware, and simple and reliable installation procedures for the carpenter in the field assure that the qualities inherent in *Munchhausen* doors and partitions are not lost. Such installations have been made since 1951—with uniformly good acoustical results. Yet the doors are as easy to open and close as ordinary doors.

Since 1954, *Munchhausen* doors have undergone repeated tests at the National Bureau of Standards under its strict, exacting methods. The sound transmission loss figures (page 3) are given for the two most popular executions: the 2⅝" and the 4" doors. These are realistic figures, directly comparable to performance figures for walls; and should not be confused with high ratings obtained from commercial laboratories.

The warranty (page 8) is a specific guarantee that the acoustical performance of each such installation is equal to that of the specimen tested at the National Bureau of Standards—rather than a simple statement that the product is made like the laboratory test specimens, or that a similar installation has given the specified results. *Architects are urged to make this warranty a part of the specification.*

The Munchhausen door principle has been awarded United States patent 2,880,471.■

in this catalog:

• ***Munchhausen* doors:** beautiful, unbroken wood faces or steel-clad . . . in two executions: 2⅝" and 4" thickness . . . . . *section* **1**

• ***Munchhausen* doors for extreme requirements:** extra large or extra thick . . . . . *section* **2**

• ***Munchhausen* operating partitions:** as soundproof as a wall . . . the only partition that permits activity on both sides without interference . . . *section* **3**

■ *This patent and the trademarks used herein are under license from H. V. Munchhausen, New York City.*

1 *Munchhausen*

SOUNDPROOF DOORS

The designer of a soundproof closure has only a few useful means at his disposal: mass, separation, de-tuning, damping, space. Good design will make maximum use of separation, de-tuning and damping, so that costly mass and space can be kept down.

To illustrate: modern acousticians build "quiet rooms" more soundproof than a medieval dungeon but weighing relatively little. They place a "floating room" on springs in a rigid room, avoiding all stiff connections. The "floating" walls, floor and ceiling are smaller than the outer shell and thus have a higher natural frequency (the sound you hear when you tap). Fibrous materials and viscous treatments are used as damping between the two shells. Of course, all openings are sealed with great care.

The same approach governs the design of the *Munchhausen* door. It is the absence of this approach which explains the failure or, at best, indifferent success of the numerous other attempts in this field.

For some years, H. V. Munchhausen, widely known acoustical designer and consultant, had felt that there must be a good, practical way of translating these simple yet advanced concepts into door design. The design we introduced in 1951, and which has since met with such remarkable success, embodies the features described and illustrated below.

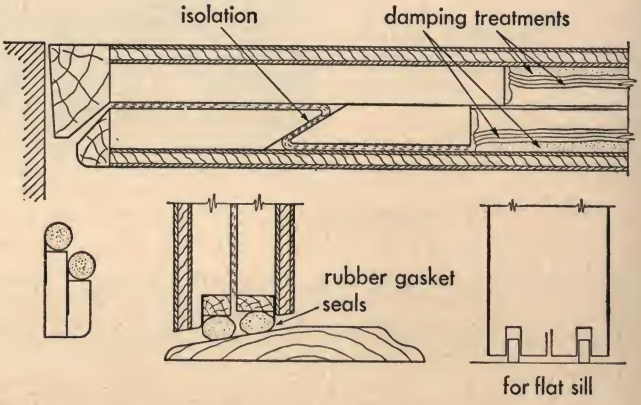
• **complete separation:** Discontinuity between the two faces. Transmission through solids reduced to a minimum. A subframe is built into the main frame over an interlay of special sound vibration isolation materials.

Doors made in accordance with this design of interlocked yet separate frame elements are exceptionally durable and warpproof.

• **de-tuning:** Panels differ as to free span and mass. The "beat" (difference in natural frequency) of the two panels kills resonance, thus improving soundproofness.

• **panel damping:** A viscous treatment having an exceptionally high degree of inertia is applied directly to the inner panel faces, and is covered in turn with high-density membranes which have maximum effect in the low-frequency range.

• **double seals:** Ultra-compliant double gaskets staggered for best performance in pre-fabricated, pre-fitted door stops provide a soundproof seal at the jambs and head. Two similar gaskets with an even more durable cover are installed in the door bottom and close against our slope saddle. For level sills we provide two automatic, plunger-operated drop seals.



sizes and typical applications

standard: 2⅜" thick; maximum size, 4' x 8'6"; unbroken wood faces or steel clad—for music departments, studios (many radio, TV and recording studios use these doors without sound locks), doctors' offices, hospitals, private offices, laboratories, machinery rooms, many other applications.

special: 4" thick; maximum size, 6' x 14'6"; unbroken wood faces or steel clad—for offices requiring extreme privacy; to contain extra loud machinery noise; in sound studios direct to busy hallways; in acoustical laboratories; for many other exceptionally high requirements.

Munchhausen Soundproofing Company is the only organization devoted exclusively to the design and manufacture of high-performance soundproof constructions. This specialization has produced a fund of knowledge and experience in the application of soundproof doors, partitions and other products which is unique. It has been found that this valuable asset can best be made available to the architect through direct communication. Trained representatives and our design service department will be glad to serve you.

suggested door specifications, frame and hardware recommendations

► doors

Soundproof doors shall be the *Munchhausen* door as furnished by Munchhausen Soundproofing Company. Doors shall be (2⅜") (4") thick and shall have flush unbroken surfaces on each side. Doors shall be constructed so that the sound insulation of the opposite faces is carried completely through the door from edge to edge and from top to bottom with no point of rigid or wood or metal contact. Panels on opposite faces shall differ substantially as to natural frequency. Sides and top of door shall have staggered edges shaped for positive contact against two staggered gaskets mounted in prefabricated door stops. A set of prefabricated door stops containing two gaskets of highly compliant and resilient material in a staggered arrangement to meet that of the door edges shall be supplied with each door.

The door bottoms shall be sloped to be parallel with a sloped oak saddle (by door supplier) or a sloped metal saddle or small ramp (by others). Installed in the sloped door bottoms shall be two highly compliant durable gaskets. (Alternative, for flat sills: The door bottoms shall have two grooves for drop seals. The door supplier shall supply two automatic drop seals for each door.)

Doors shall be of a construction that has been tested by the National Bureau of Standards for sound transmission loss of: (40 db as a 2⅜" panel) (48 db as a 4" panel) and in actual operating installation (37 db as a 2⅜" door) (42 db as a 4" door).

Supplier shall guarantee that each door supplied under this specification is substantially equal in construction *and sound transmission loss* to the sample tested at National Bureau of Standards. Supplier shall further guarantee for each door installation, carried out in accordance with supplier's simple instructions, a sound transmission loss within three decibels of specimen installation tested at National Bureau of Standards.

for steel clad doors, *add:* Doors shall be clad by manufacturer with 24-gauge steel in such a manner as to fully preserve the separation and insulation of the opposite panels and their framing.

► hardware *(by others)*

locks

cylindrical (preferred): Federal specification FF-H-106A—either type 161N passage sets or type 161A locksets—with backset link to 5" (Schlage or equal).

mortise: Federal specification FF-H-106A, type 86—with special backset, 4" min.; or standard backset with lever handle and spring rose on door stop side. On HM opening frames with molded stops, use special large backset only.

Specify door thickness, hand and swing. Lock extension for thickness is entirely on door stop side.

hinges

for 2⅜" doors: 4½" x 4½" or 5" x 5"—full or half mortise (not surface or strap).

for 4" doors: 5" x 5" or 6" x 6"; ball-bearing preferred. For doors to 4' x 8', three butts (not surface or strap). For large doors, Rixson intermediate pivots, M3 or M3W (or equal).

► frames *(by others)*

wood (or kalamein) buck and jamb: fill shim spaces with felt.

hollow metal with flat jamb faces, no molded stop (we supply gasketed stops): coat back of frame with ⅛" asbestos fibre roof cement; fill frame with mansonry or grouting (for existing hollow metal frames, with or without stops, ask for special details).

channel or bent plate, kalamein frame: grout well.

► weight

2⅜": 7 lbs/sq ft
4": 12 lbs/sq ft

► vision ports *(when specified)*

usual size: 10" x 10"
max. width: door width less 20"
max. height: 30"

sound transmission loss ratings by National Bureau of Standards, decibels

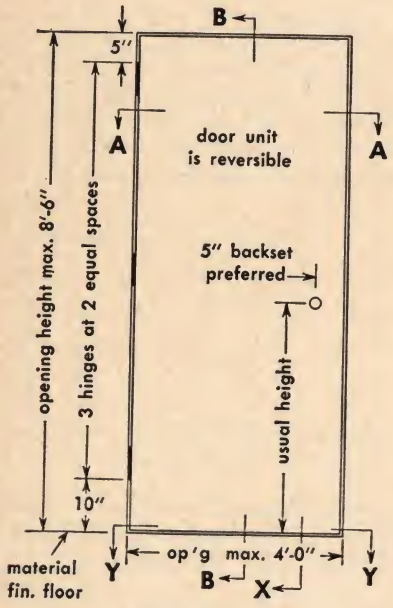
under recommended practice ASTM E90-50T—ASTM E90-55 of American Society for Testing Materials; Z24.19-1957 of American Standards Association: reverberant sound field method

cycles/second	125	175	250	350	500	700	1000	1500	2000	3000	4000	average
2⅜" door												
operating value (actual working installation)												
with slope bottom and saddle (NBS 639, 1957)	31	30	35	29	36	34	36	39	44	47	48	37
with two drop seals (NBS 612, 1954)	29	33	33	32	36	34	34	...	41	...	40	35
panel value (door sealed in) (NBS 613, 1954)	32	38	38	35	39	38	42	...	49	...	53	40□
4" door												
operating value (actual working installation)												
with two drop seals ■ (NBS 641, 1957)	34	32	37	36	39	43	42	45	51	53	53	42
panel value (door sealed in) (NBS 642, 1957)	39	37	41	40	45	47	50	54	56	58	62	48

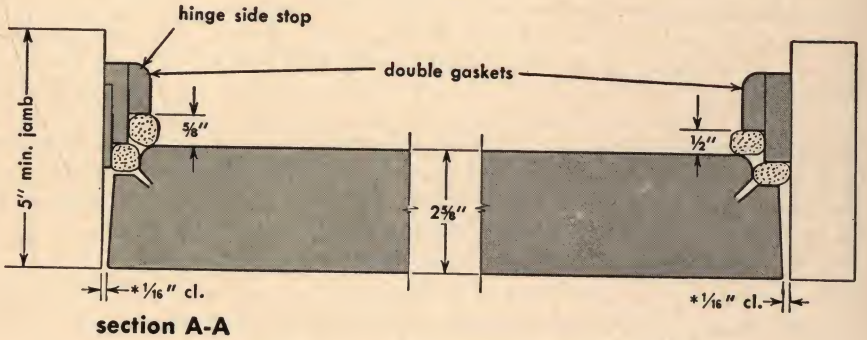
□ When tested as an operating installation, *Munchhausen* doors, because of their excellent edge seals, lose relatively little of their panel value. The new slope seal and saddle is an important improvement, especially at the higher frequencies, and should be used whenever a standard height saddle of oak or metal or a slight incline is practical.

■ The slope bottom execution of the 4" door has not yet been tested at NBS. We prefer this execution as more soundproof. It should be used whenever a saddle or slight incline is practical. Our own tests show that the improvement is about the same as for the 2⅜" door.

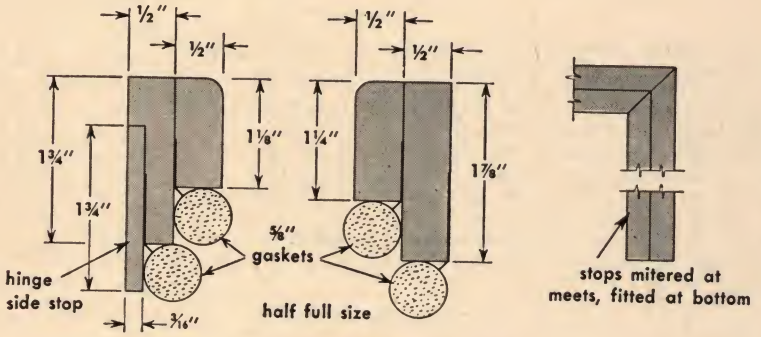
2⅝-inch doors scale: 3″=1′0″ (½ size details on request) note: *Kalamein clearance ⅛″



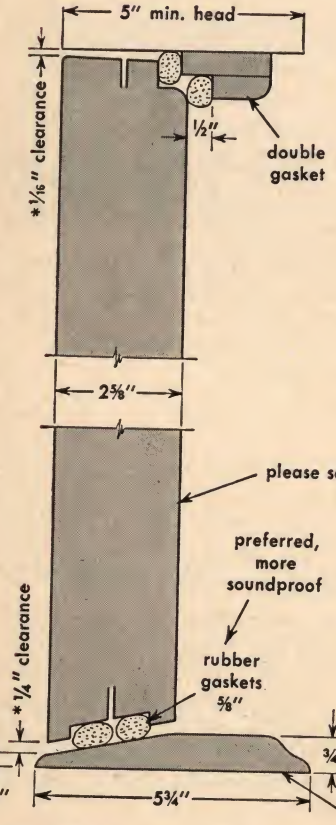
elevation



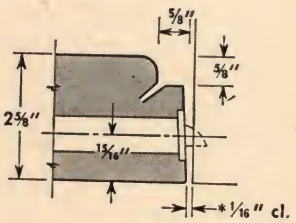
section A-A



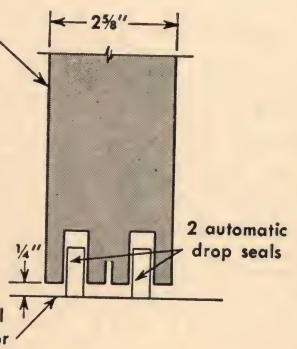
gasketed door stops



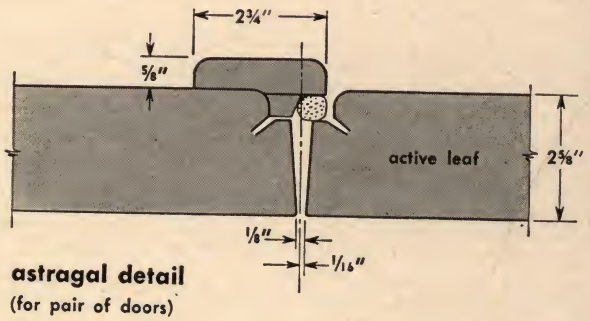
section B-B
slope bottom and oak saddle (by us), or metal saddle or small ramp (by others)



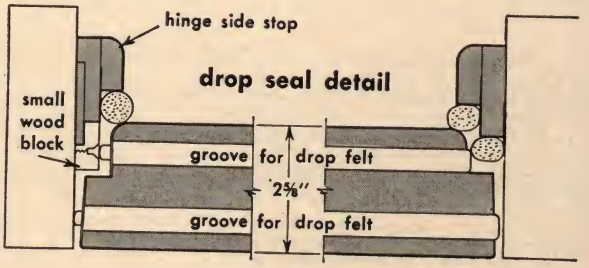
lock location
or as per hardware manufacturer's template



section X
for flat sill

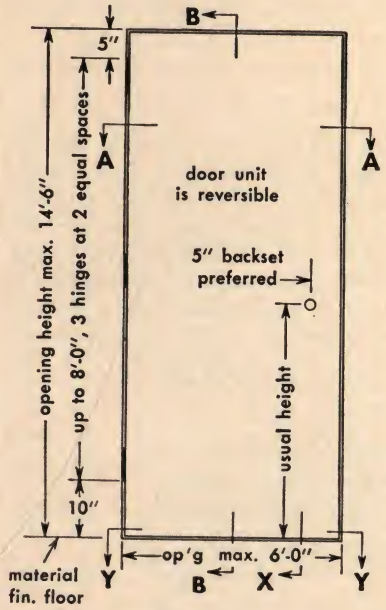


astragal detail
(for pair of doors)

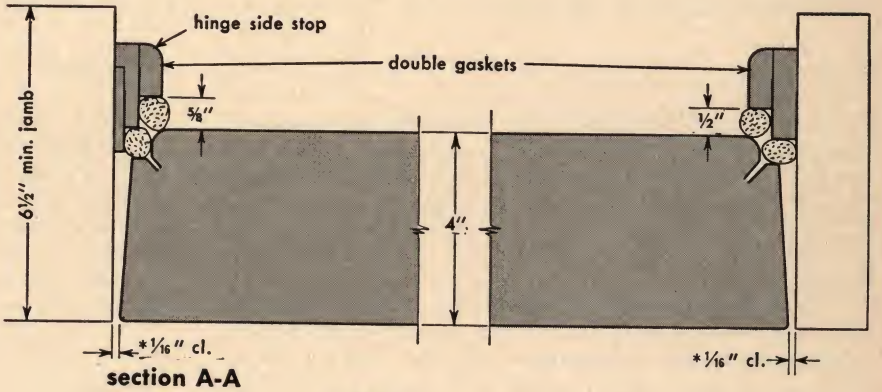


section Y-Y

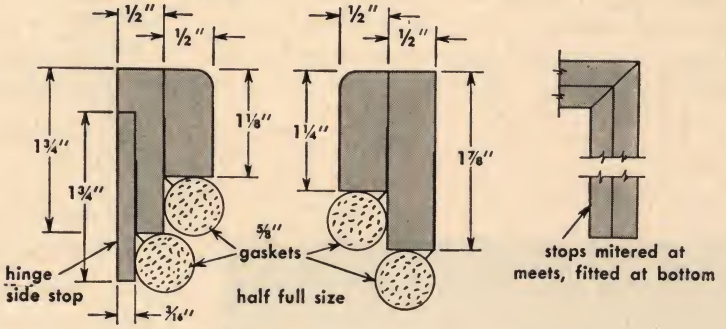
4-inch doors scale: 3″=1′0″ (½ size details on request) note: *Kalamein clearance ⅛″



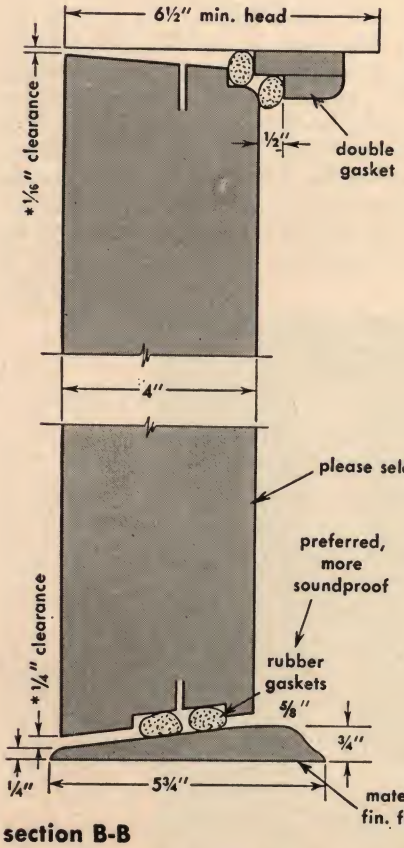
elevation



section A-A

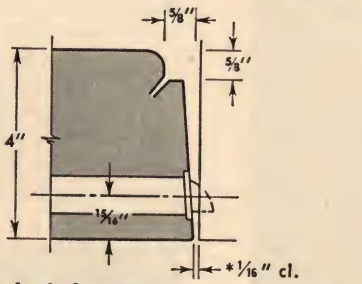


gasketed door stops



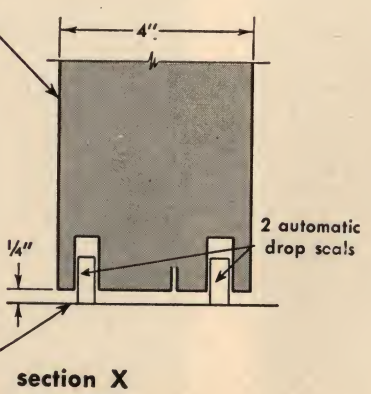
section B-B

slope bottom and oak saddle (by us), or metal saddle or small ramp (by others)



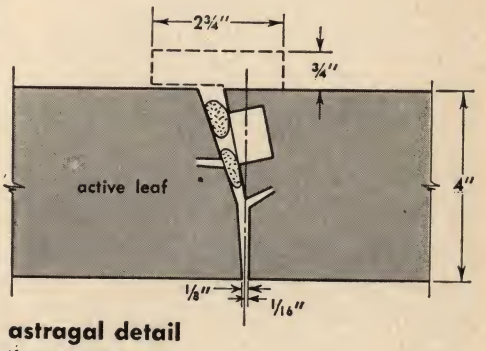
lock location

or as per hardware manufacturer's template



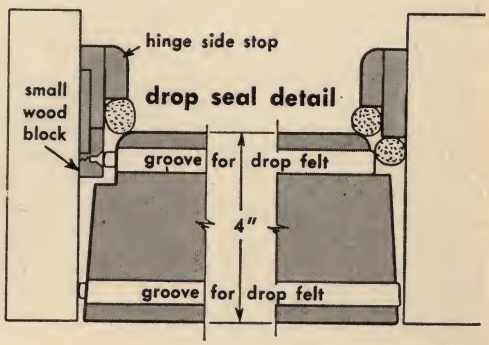
section X

for flat sill



astragal detail

(for pair of doors)



section Y-Y

2 *Munchhausen*

SOUNDPROOF DOORS FOR EXTREME REQUIREMENTS

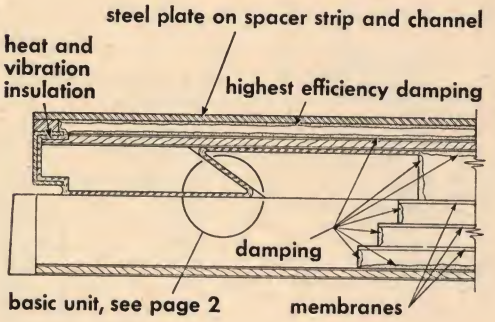
extra large

Unusually large *Munchhausen* doors are made for specific installations in all-wood or metal-clad construction. The acoustical performance of these doors is high, their unit weight low, their edge-sealing uniquely effective. Consequently, these extra large doors achieve superlative results and are surprisingly easy to operate.

Shown below is a pair of *Munchhausen* doors, 22′ high and 13′ wide, separating two theatre stages at Wellesley College. These doors permit both stages to operate simultaneously without interference: the sound transmission loss exceeds the guaranteed 45 db. The hinges (also our own design) permit operation of each 2000-pound door leaf with one finger.

extra thick

To attain a sound transmission loss of 50 db or better, *Munchhausen* doors are custom-made in thicknesses 6″ and over—in all-wood or metal-clad construction. These extra-thick doors are used on such installations as communicating doors between instrumental music rooms and similar high-sound-level applications. A blast-resistant maximum-soundproofness design in wood-and-steel construction is used for jet engine test cells and like applications; a section through its framing is shown below.



twins and opposites

In many cases having maximum requirements, two *Munchhausen* doors are used. A typical example is pictured below: the sound laboratories of RCA-Victor, Cherry Hill, N. J. The top-performance anechoic chambers (STL 70 db±) are entered through two *Munchhausen* doors: a 4″ door in the rigid shell; a 2⅜″ door in the floating inner shell. (See "The AF Anechoic Chambers at Cherry Hill" in IRE Transactions on Audio, vol. AU-4, No. 6, 1956.)

3 *Munchhausen*

SOUNDPROOF OPERATING PARTITIONS

Munchhausen operating partitions combine the three requisites for a truly successful installation: wide design adaptability, unmatched acoustical performance, and highly attractive woodworking beauty. Their component panels are fabricated to produce the desired amount of sound interception. Their panel interlocks, their top and bottom acoustical seals and their end securements are designed with great care and in strict adherence to Munchhausen acoustical concepts. And the degree of soundproofness of the finished installation is *guaranteed!*

Obviously, a partition composed of the most soundproof panels will be as soundproof as a wall only if sound leaks at the periphery have been virtually eliminated. This has been accomplished by the changer rack design (see diagrams)—the first basic advance in many years in the field of operating partitions.

Each panel is set in motion by a light push and upon reaching position its concealed 6″ riding wheels are *retracted*. Seating itself solidly on the narrow, inconspicuous track which is level with the floor, it locks its several acoustical seals both at the floor and in the ceiling guide track. This guide track is unbroken to prevent overhead by-pass leaks.

The changer rack stacks the panels side by side in a space-saving storage area which is usually adjacent, but can be located away (for instance on the other side of a hallway) or inside the room contour itself. Storage area is determined by width and number of panels.

These partitions use the *Munchhausen* 4″ door (48-db panel) as their basic unit. For maximum acoustical requirements, exceptional height, or sculptural effects such as reveals, the 6″ panel or other custom door designs are used. Panel widths can be from 3½′ to 8′. The total length of the partition has no limitation.

acoustical efficiency

Munchhausen operating partitions, because they intercept sound as efficiently as a wall, are in an entirely different class than commercial folding partitions made of wood doors or scissor-frame arrangements of plastic. (According to a recent study,• the sound reduction of such partitions, some of which claim to be "40 db panels," ranges from 7 to 22db.)

In fact, these *Munchhausen* operating partitions fulfill the basic function heretofore unattainable: they are actual walls which can be removed at will. Naturally they are more expensive than non-soundproof partitions—but they add space to the building at a fraction of the unit construction cost.

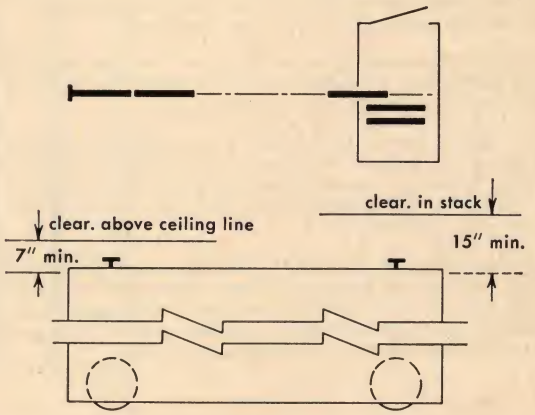
• *"Field Survey of the Noise Reduction of Folding Partitions" by Dr. Howard C. Hardy, at ASA meeting in Washington, D. C., May 1958.*

specification

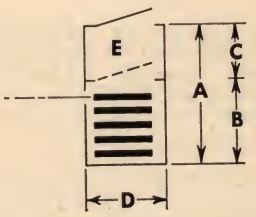
Operating partitions shall be changer rack partitions as manufactured by Munchhausen Soundproofing Company, Inc. Panels shall be 4″ thick *Munchhausen* panels.

Contractor shall guarantee that panels are made similar to sample tested at the National Bureau of Standards, and that the finished installation will have a sound transmission loss within three decibels of an operating door installation tested at said Bureau.

Contractor shall install floor, ceiling and storage hardware, and later the partition itself. Careful preparation of structure including floor, ceiling and storage area, ready to receive the hardware and partition, shall be done by others.



A = entire-rack area
B = loaded-rack area
C = empty-rack aera
D = panel-width-plus dimension
E = in some cases, this area not required. Details on request.



House of Seagram's, New York

toward better results in soundproof construction . . . by H. V. Munchhausen

The architect who designs for a high degree of soundproofness on a project usually finds his work fairly clear-cut where the masonry is concerned. Yet the finished job often falls short of its acoustical purpose because soundproof door performance does not measure up to the data on which the selection was based.

There are many reasons why this may occur: unrealistically high decibel figures may have been based on tests made while procedures were still quite inaccurate and exaggerations by ten or fifteen decibels were common, or the figures given were "sound reduction" values, which include the sound absorption of the room, instead of the acoustical performance of the test panel alone (known as "sound transmission loss"); the test door may have been sealed tight into the opening (thus being many decibels more soundproof than an operating door), or the test may have been made in a laboratory which customarily reports high figures.

Whatever the reason, "optimistic" ratings do not help the architect. He needs data as reliable as those which are available for conventional masonry walls. The Munchhausen figures meet this need. The facts presented are unadulterated. All our published figures are from the National Bureau of Standards—an agency created to serve the public interest. In the opinion of most experts there is no test nearly as reliable as that carried out under the Bureau's strict, exacting procedures. Not only the "panel value" of each door we make but also the "operating value" of each installation is guaranteed. This guarantee is possible because simple, foolproof installation methods for the field carpenter have been developed, and edge seals that are easy to fit and need no adjustments are used—and we have never "doctored" a test installation.

The architect and the acoustical expert are thus given a dependable design basis. The performance we announce can be trusted to be present in the finished installation, and will be a lasting feature.

Because of this realistic attitude toward their problem, some architects and many acoustical consultants now specify us exclusively. As one specification writer whose firm generally steers clear of closed specifications told us, "When our best protection is to be found in an exclusive specification, we write it that way."

Others prefer to specify our construction, demand that a laboratory test report from the National Bureau of Standards be submitted, and insist on a guarantee that each finished installation will produce the sound transmission loss promised. Either approach assures that the architect's stated requirement is uncompromisingly fulfilled.

warranty

Munchhausen Soundproofing Company, Inc. warrants that *Munchhausen* trademarked doors are equal to its specimens submitted to the National Bureau of Standards and tested by said Bureau as reported in the present catalog; and that if tested at said Bureau any such door will be found to have a sound transmission loss average equal within two decibels to that of the test specimen.

This company further warrants that any field installation of a *Munchhausen* trademarked door, being installed in accordance with our simple instructions as to erection and as to frame treatment, when tested in the field will be found to have a sound transmission loss average equal to that of the corresponding specimen installation tested at the National Bureau of Standards, within three decibels.

The above warranties are predicated upon reasonable treatment as set forth in the Standard Door Guarantee of the National Woodwork Manufacturers Association having been accorded the doors. The woodworking qualities (material and workmanship) of our doors are warranted to equal or exceed those set forth in said Guarantee.

For any *Munchhausen* trademarked door which does not meet the warranties stated above, Munchhausen Soundproofing Company, Inc. will deliver a replacement door f.o.b. job site.

For doors of special design and for operating partitions, a special warranty stating the acoustical performance of the installation is given.

from the roster of installations

manufacturing plants: General Motors, Chrysler, Ford . . . RCA, General Electric . . . Brooklyn Union Gas

educational buildings: New York University, University of Michigan, University of Virginia, Louisiana State, Barnard College, Wellesley, Colgate, Shasta College, Orah Dee Clark (Alaska)

aircraft plants: Convair, Douglas, Marquardt, Curtiss-Wright, North American

hospitals: Walter Reed Hospital, National Institutes of Health, Veterans Administration, Beilinson Hospital (Tel Aviv), Institute for Crippled and Disabled (New York), Lighthouse for the Blind (New York)

armed forces: Hickam Field, Fort Shafter (Hawaii); Fleet Sonar School (Key West); Mather Field (California)

offices: J. Walter Thompson, Seagram, Revlon, Lederle Laboratories, IBM, CIT

radio stations: WABC and WMGM (New York), WXYZ and WJBK (Detroit), WGBI (Scranton, Pa.)

soundproof door specialists representing the Munchhausen organization

The specialists listed below and our New York staff will be happy to work closely with you and your acoustical consultant on your soundproof closure problems.

California, *south:* The Bus McNeil Co.
641 So. Atlantic Boulevard, Los Angeles 22

California, *north:* Larue J. Woodson
610 16th Street, Oakland 12

Colorado: Edward E. Dustin Co.
1050 South Jackson Street, Denver 9

Delaware: Delaware Suppliers, Inc.
3110 Lancaster Avenue, Wilmington

Florida, *north:* Builders Products Company
221 East 8th Street, Jacksonville

Florida, *south:* Acousti-Insulation, Inc.
244 Romano Avenue, Coral Gables

Hawaii: Lewers & Cooke, Ltd.
404 Piikoi Parkway, Honolulu 2

Illinois: Tri-State Co.
3044 N. Laramie Avenue, Chicago 34

Indiana: Building Specialties Company
1102 West 25th Street, Indianapolis 23

Massachusetts: J. A. O'Brien & Sons
1469A Washington Street, West Newton 65

Michigan: Wolverine Door Co., Inc.
2966 E. 7 Mile Road, Detroit 34

Minnesota: Straughan Hardware Co., Inc.
1115 Hennepin Avenue, Minneapolis 3

Ohio: The Myron Cornish Company
P.O. Box 63, Far Hills Station, Dayton 9

Tennessee: Folding Doors & Windows
632 Court Avenue, Memphis

Texas: Samuel A. Ellsberry Co.
3136 Routh Street, Dallas 22

Virginia: J. S. Archer Co.
328 West Cary Street
Richmond 20

Washington: Bradley-Zesbaugh Inc.
White-Henry-Stuart Building
Seattle 1

Munchhausen Soundproofing Company, Inc.
290 Riverside Drive, New York 25, N. Y. *RIverside 9-6400*

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